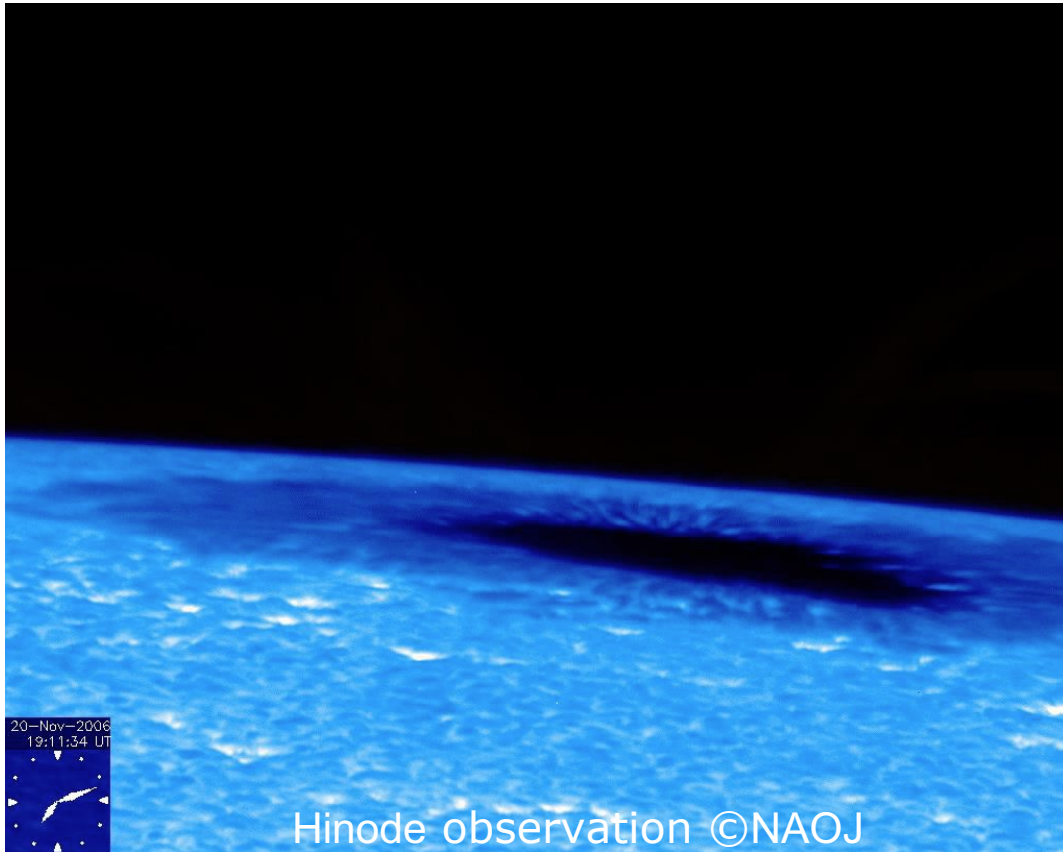


Space-borne solar experiments with the polarization measurement

Ryohko Ishikawa, Takayoshi Oba, Joten Okamoto, Yukio Katsukawa,
Yusuke Kawabata, Masahito Kubo, Akiko Tei (NAOJ),
Yoshihiro Naito (SOKENDAI), Ryohtaro Ishikawa (NIFS),
Daiki Yamasaki (ISAS/JAXA), Haruhisa Iijima, Takuma Matsumoto (Nagoya U)

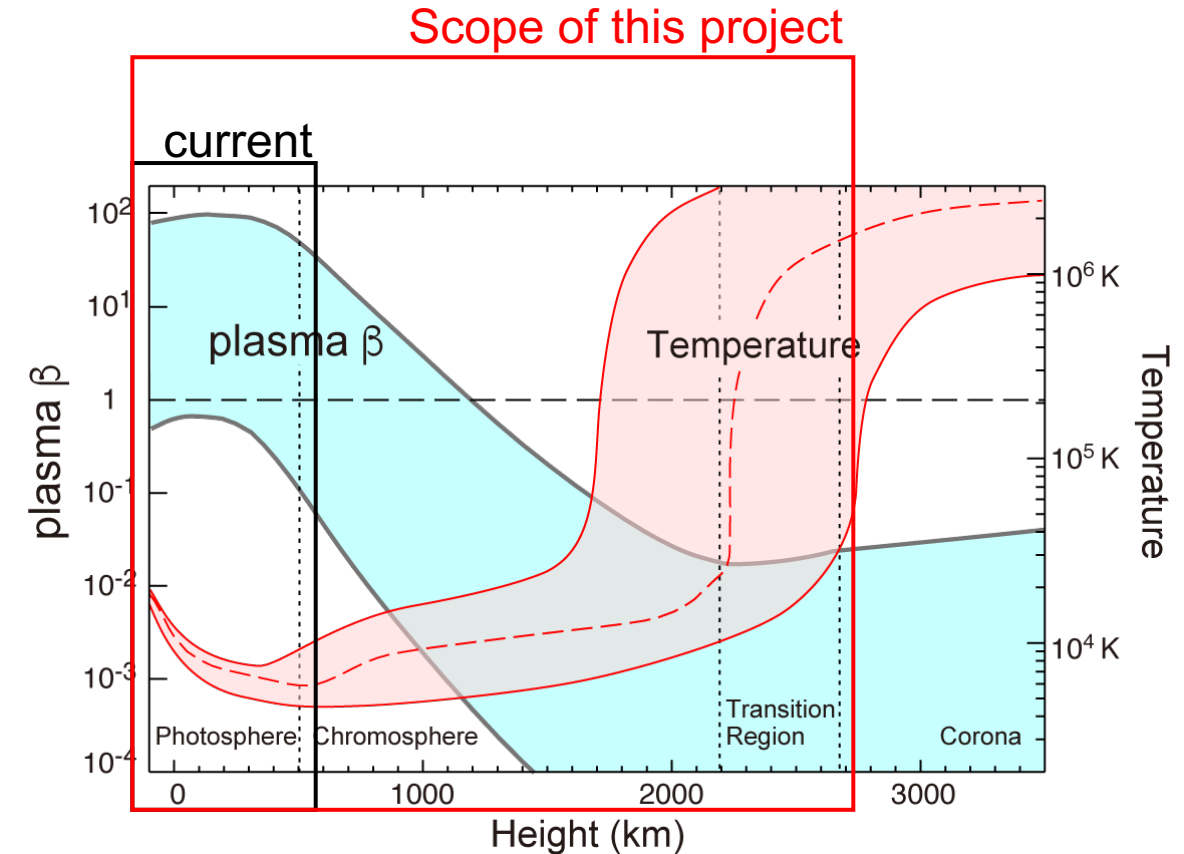
Magnetic Field Measurement in $\beta < 1$ Region



Quiet
photosphere
($\beta > 1$)



Dynamic
chromosphere
($\beta < 1$)



- Seamless magnetic field ($\mathbf{B}$) measurements by multi-line spectro-polarimetry with high spatial resolution from the space

Two pioneering space-borne experiments led by NAOJ

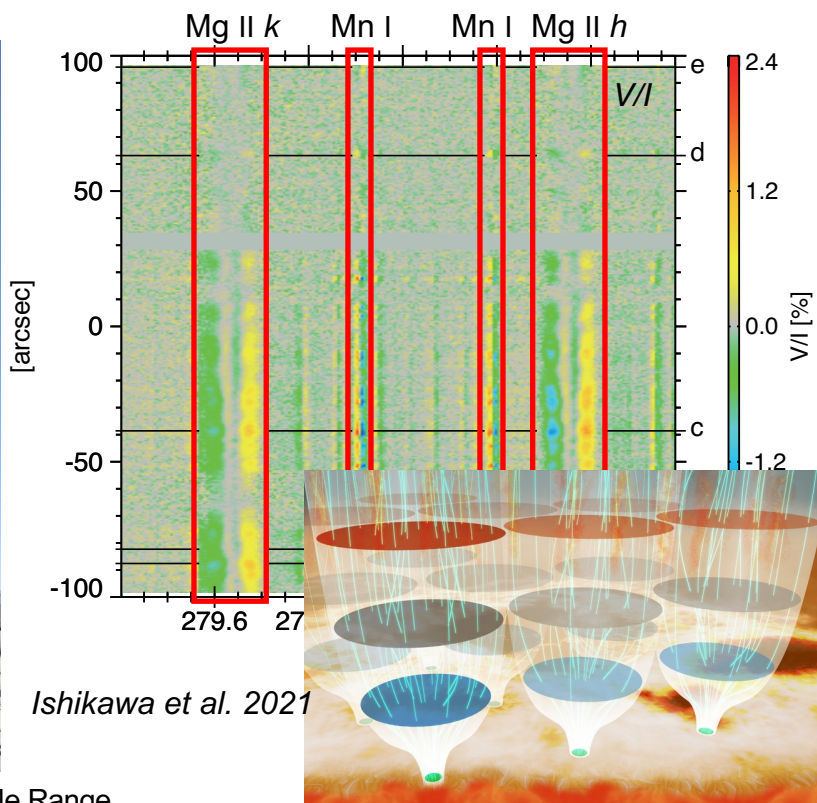
Sounding rocket CLASP (2015, 19, 21)

with NASA/MSFC, IAS (France), and IAS (Spain)

- UV spectro-polarimetry
- ***B*** from bottom to the top chromosphere



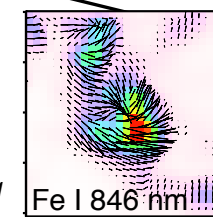
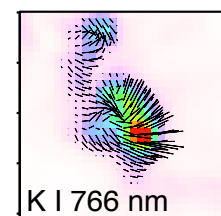
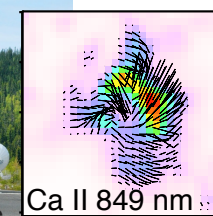
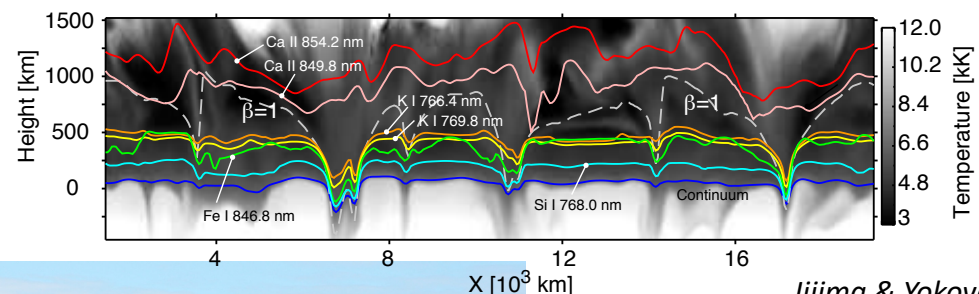
US Army Photo, White Sands Missile Range



SUNRISE-III balloon SCIP (2024)

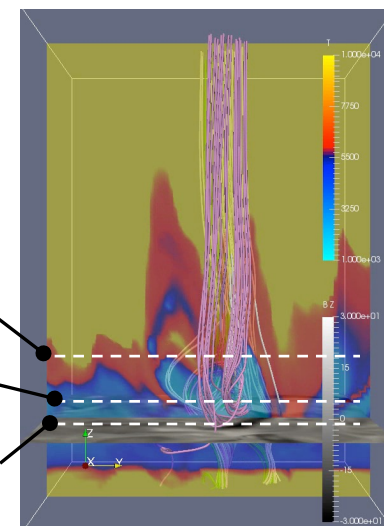
with IAA (Spain) and MPS (Germany)

- IR spectro-polarimetry
- ***B*** from photosphere to chromosphere



Quintero Noda et al. 2021

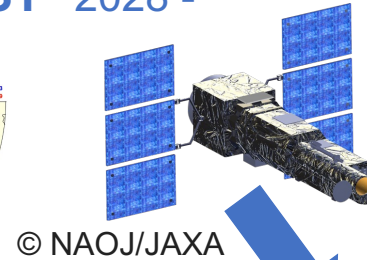
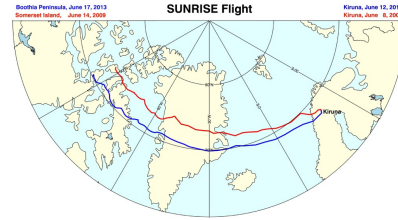
Iijima & Yokoyama 2017



Spectroscopy from transition
SOLAR-C region to corona (**UV**)
EUVST* 2028 -

SUNRISE-III balloon SCIP*
2014 (~1 week)

Photosphere –
middle chromospher B
measurement (**IR**)



**New space-borne
missions
(rocket and/or balloon)**

- Demonstrate a key technology to
establish a concept for a future
satellite mission

* indicates the missions
led by the Japanese
solar physics community



© MPS

Now



© DKIST (NSO/AURA/NSF)

Ground-based telescopes
DKIST (4m, Hawaii), SST (1m, La Palma),
GREGOR (1.5m, Tenerife), GST (1.6 m, Big
Bear), ...

Photosphere-**middle
chromosphere, corona B**
measurement (**VL-IR**)

Hinode satellite*
2006 - now



© JAXA

Photosphere **B**
measurement (**VL**)



© NAOJ/JAXA/NASA/IAS

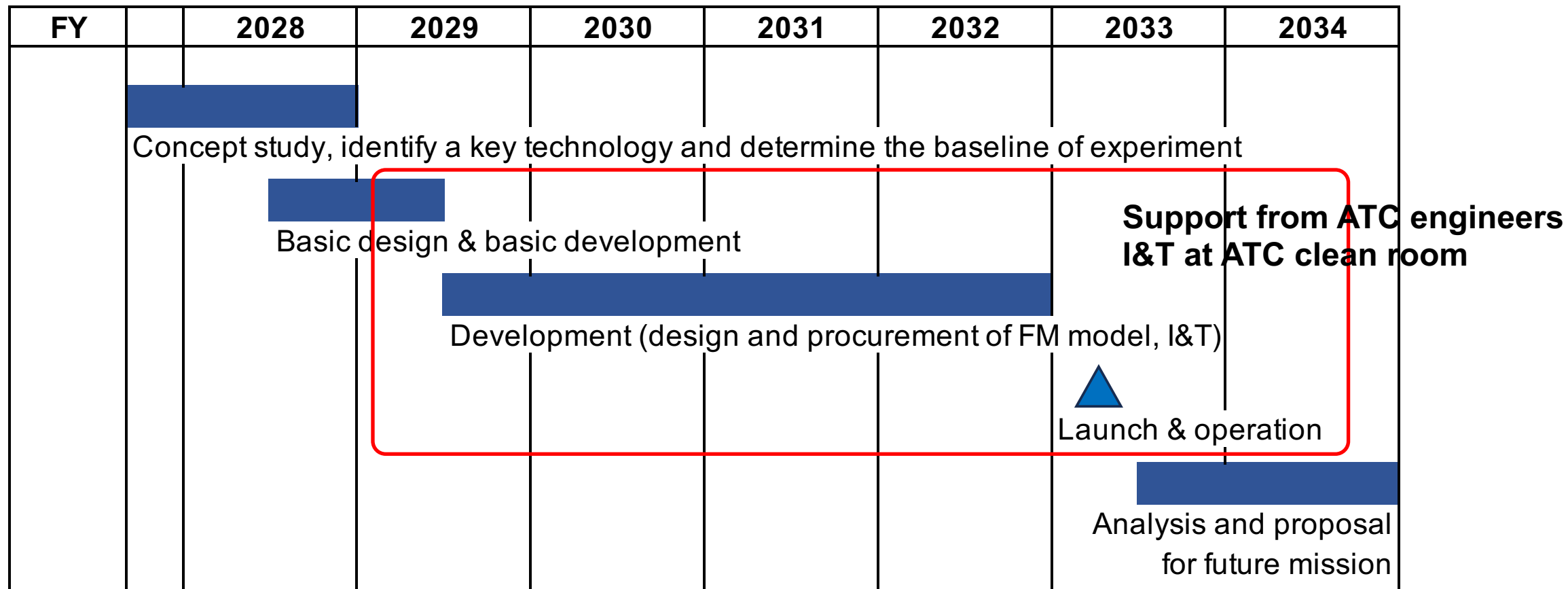
Sounding rocket CLASP*
2015, 2019, 2021 (6 min x 3 times)

**Bottom - Top chromosphere &
transition region B** measurement
(**UV**)

US Army Photo, White Sands Missile Range

Implementation Plan

Solar-C EUVST launch



- Development cost: external funding (JSPS KAKENHI, ISAS/JAXA, ...)